

REMARKS

Claims 1-5, all the claims pending in the application stand rejected. No claims are amended or cancelled.

Drawings

As a preliminary matter, Applicant notes that the Examiner has not indicated that the drawings filed with the original application are accepted. Applicant respectfully requests the Examiner to indicate that the drawings are acceptable.

Claim Rejections - 35 U.S.C. § 103

Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Fücksle et al (5,796,060) in view of Oishi et al (4,032,820) and Bues (6,660,956). This rejection is traversed for at least the following reasons.

The present invention concerns hybrid gas-insulated switch gear that is formed by a series of modules. Each module comprises a housing in the form of a single tank. Inside the single tank are a circuit breaker, disconnecting switches and grounding switches. The interior of the single tank is segregated into gas compartments.

In particular, with reference to one exemplary embodiment but without limitation thereto, the present invention arranges a plurality of modules TB2, TB11, TB12, each having a tank 20, 20A, 20B that is sealed with an electrically insulating gas and containing a circuit breaker 21 that is aligned with the axial direction of the tank, disconnecting switches 22, 23 at first and second ends of the circuit breaker inside the tank, and grounding switches 25. The hybrid gas-insulated switch gear connects the plurality of modules in a single row such that the central axis of the tanks are generally aligned and the plurality of modules are electrically connected to each other to constitute a single-line diagram unit.

The in-line arrangement of a plurality of modules that share the general structure of a gas cylinder having the circuit breaker, disconnect switches and grounding switches all within a gas-tight cylinder provides significant advantages over the conventional designs for such switches. In particular, the conventional circuit breaker system, as illustrated in Figs. 13A and 13B, present a problem with respect to size and cost, as explained at page 2 of the present specification.

Claim 1 defines the invention as being a switch gear having a plurality of modules, each module comprising a cylindrical tank, circuit breaker disposed inside the tank, disconnecting

switches disposed at opposite ends of the circuit breaker inside the tank, grounding switches electrically connected between the circuit breaker and disconnecting switches (and necessarily inside the tank). The claim specifies that the plurality of modules are arranged in a single row such that the central axes of the tanks are substantially aligned and the modules are electrically connected to each other.

Claim 2 depends from claim 1 and further requires that the modules be separated by a distance equivalent to a length of one of the modules, as illustrated in Fig. 8 and explained at page 17 of the present application.

Claim 3 depends from claim 2 and specify that the coupling of plural modules is air tight and that the disconnecting switches are electrically coupled.

Claim 4 also depends from claim 2 and specifies the presence of bushings 24 and an electrical coupling between them.

Finally, claim 5 depends from claim 1 and specifies that the container is separated into three compartments.

Füchsle

The Examiner looks to Füchsle for a hybrid gas-insulated switch gear module with a cylinder or tubular metal sealed tank 2. A circuit breaker 12 is disposed inside the tank 2 and appears to have an opening and closing operation substantially aligned the axial direction of the tank 2, as seen in the embodiment illustrated in Figs. 5 and 6. The Examiner also finds disconnecting switches 13, 18 disposed at opposite ends of tank 2 and electrically connected to breaker 12. Ground switches 17, 14, which are electrically connected between breaker 12 and switches 13, 18 are found in Fig. 2. Finally, the Examiner asserts that Füchsle discloses at col. 2, lines 8-58 that the switch gear module 2 can form a multiplicity of switching configurations which can be completed on site by electrically interconnecting module 2 with other switch gear current connections to provide a desired switching configuration. However, the Examiner admits that Füchsle does not teach a single line switching unit configuration.

Oishi et al

The Examiner looks to Oishi et al for an illustration of a horizontal single line switching unit configuration involving breakers 8W1-8W3, which are electrically connected in a single row or unit in Figs. 16-17. The Examiner asserts that one of ordinary skill would combine Füchsle

with Oishi et al to enable reduction in size and costs due to each module 2 housing the majority of all the required switch gear for easy onsite installation.

Bues

The Examiner mentions at page 4 of the Office Action that Bues teaches a three-compartment switch arrangement.

The flaw in the Examiner's analysis is that the structures in the three-cited references are completely different, incompatible and fail to provide or suggest achievement of a switch gear having a plurality of modules arranged in a single row.

Füchsle teaches two embodiments of a gas insulated switch gear, each of which clearly relates to a single module design that cannot be connected to other modules. The structure of the Füchsle two embodiments requires rotation of shaft 21 such that conductive segment 24 engages either of fixed contacts 28, 29 as illustrated in Figs. 5 and 6. The alternative embodiment Figs. 7 and 8 similarly requires rotation of a shaft such that a linkage 42, 44 can cause connection and disconnection between contacts 35, 36 and fixed contacts 28, 29. Nothing in Füchsle teaches or suggests ganging modules of either embodiment in a horizontal row. Moreover, the structure of Füchsle necessarily is limited to a single independent module for several reasons. First, the drives 9 and 10 at opposite axial ends of the device would preclude axial connection of plural modules. Second, the structure in the module requiring a shaft to rotate the disconnection switches would have to be connected and rotatable together if modules were ganged. This feature provides a challenging technological barrier that would preclude in-line horizontal arrangement of plural modules.

The Examiner's reference to Figs. 16 and 17 of Oishi does not provide the necessary teaching or suggestion for a modification of Füchsle. Indeed, these figures simply show a linear arrangement of several independent structures including separate disconnecting switches 6, circuit breakers 8 and current transformers 7. All of these structures are separate and independent, having an arrangement that the Applicant distinguished with regard to the conventional approach illustrated in Figs. 13A and 13B. The arrangement of plural circuit breakers 8 does not teach and suggest an in-line arrangement of complex modules as in the present invention. The disclosure of Oishi et al does not even hint at the advantage of the present invention, as explained at page 11 with regard of the first embodiment, where the number of

tanks used is significantly reduced compared to when the circuit breakers, disconnecting switches, grounding switches, etc. are each housed in separate tanks and electrically insulating spacers are necessary.

The patent to Bues similarly is ineffective to teach the present invention or suggest modification of the other two references. Bues is clearly a self contained unit having three separate compartments, two of which are dedicated to separate switches and the third dedicated to a circuit breaker 6. Nothing in this structure would teach or suggest the adaptation of a design to housing all components within a single cylinder and connecting several of such modules inline so that costs and materials can be saved.

On the basis of the foregoing analysis, Applicant does not believe that any amendment to the claims is required.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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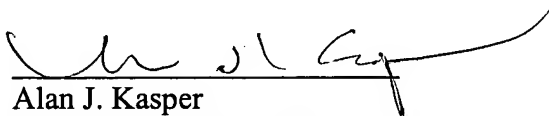
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